The Jazz Transformer on the Front Line: Exploring the Shortcomings of AI-composed Music through Quantitative Measures

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Abstract

This paper presents the Jazz Transformer, a generative model that utilizes a neural sequence model called the Transformer-XL for modeling lead sheets of Jazz music. Moreover, the model endeavors to incorporate structural events present in the Weimar Jazz Database (WJazzD) for inducing structures in the generated music. While we are able to reduce the training loss to a low value, our listening test suggests however a clear gap between the average ratings of the generated and real compositions. We therefore go one step further and conduct a series of computational analysis of the generated compositions from different perspectives. This includes analyzing the statistics of the pitch class, grooving, and chord progression, assessing the structureness of the music with the help of the fitness scape plot, and evaluating the model's understanding of Jazz music through a MIREX-like continuation prediction task. Our work presents in an analytical manner why machine-generated music to date still falls short of the artwork of humanity, and sets some goals for future work on automatic composition to further pursue.